IN THE SPECIFICATION

Please replace paragraph [0030] starting on page 4 with the following rewritten paragraph:

Fig. 9 illustrates set-partitioned, multiple-assigned 16QAM signal points, for modes 1 and 3 in the case of Fig. 9(a) and for modes 2 and 4 in the case of Fig.[[4(b)]] 9(b).

Please replace paragraph [0046] starting on page 6 with the following rewritten paragraph:

Next, this method will be described with reference to two code modes, one with stronger error protection at certain levels and one with equal error protection. Fig. 5 shows a multi-level code defined by length L, hereinafter referred to as code l. Code l is a four-level code with two modes. Code l1 is a mode-index code that is a repetition code of zeros or ones with Hamming distance L. Using (N, K, d) to describe the number of bits (N), the number of information bits (K) and the Hamming distance (d), code l2 is a (L, L-1, 2) parity check code, and codes l3 and l4 are uncoded (L, L, 1) codes. Fig. 6 shows the set-partitioning method used for multi-mode transmission implanted with equal error protection and unequal (stronger) error protection for code l2. A 16QAM system is used. Because l1 is a mode-index code, the first bifurcation corresponds to the mode. After l1, the set-partitioning method is divided into SP1 for mode 1 and SP2 for mode 2. SP1 is a conventional set-partitioning in which the Euclidean distance between signal points doubles in proportion to the code level, which SP2 is set to extend the average distance between signal points of l2. Therefore, unequal error protection can be achieved by sending the mode-2 code. Table 1 below lists the code distance characteristics, where Δ is the distance between the 16QAM signal points shown is Fig.6. MSED is ~~minimum squared~~ Minimum Squared Euclidean Distance ~~distance~~; a higher MSED indicates better bit error characteristics in a white noise environment. MSED, and the MSD, Minimum Symbol Distance, and MPD, Minimum Product Distance, are

referred to herebelow~~, are described in detail by D. Divsalar and M. K. Simon in "The design of trellis coded MPSK for fading channels: Performance criteria," (IEEE Trans. Commun., vol. 36, pp. 1004-1012, Sept. 1988)~~. In Table 1 below, the average MSED of l2 <u>is</u> in the same mode when the generation of codes is equally likely. The mode-2 value is 1.5 times as large as that in mode 1. From here, the improvement in the l2 transmission characteristics of mode 2 will be understood.

Table 1

	Mode 1	**Mode 2**
code level	4	
l1 code	mode-index code	
l2 code	(L, L-1, 2)	
l3 and l4 code	(L, L, 1)	
modulation	16QAM	
signal partition	SP1	SP2
trans. Rate (bit/sym)	(3L – 1)/L	
MSED between different modes	$L\Delta^2$	
same-mode MSED of l2	$4\Delta^2$	$4\Delta^2$
average same-mode MSED of l2	$4\Delta^2$	$6\Delta^2$

Please replace paragraph [0050] starting on page 8 with the following rewritten paragraph:

Here, l1 is a mode-index code which is a repetitive parity code with a 2L/3 Hamming distance. In all modes, l2 is an (L, L-1, 2) single-parity check code. l3 and l4 are only sent in modes 1 and 2. The transmission rate differs markedly between modes 1 and 2, and modes 3 and 4, because of the difference between l3 and l4. MSD, which is ~~minimum symbol distance~~ <u>Minimum Symbol Distance</u>, and MPD, which is ~~minimum product distance~~ <u>Minimum Product Distance</u>, are parameters for evaluating a coed in a high- and a low-SNR

(~~signal/noise ratio~~ Signal/Noise Ratio) fading environment. In each case, a higher value indicates better transmission characteristics.

Please replace paragraph [0052] starting on page 9 with the following rewritten paragraph:

Fig. 9 shows 16QAM signal point assignments used for code 2. Because the 16QAM and QPSK signal points are stacked, the overall modulation is carried out using only the 16QAM signal plane. This can also be done using a mode-index code and changing the set-partitioning for each mode. In accordance with this method, by using the mode-index code to extend the distance between different modes and using a different set-partitioning for each mode for that point, it is possible to maintain the distance between code words even in a multiple-assigned signal configuration. Fig. 10 shows the set-partitioning method used in modes 1 and 3. After l1, branching according to mode is possible. This can also be done with respect to modes 2 and 4. As a result, the set-partitioned, multiple-assigned 16QAM signal point configuration of Fig.9 can be obtained. Code 2 deciding is carried out by Viterbi decoding using the trellis diagram show in Fig. [[1]] 4(b). Because a mode-index code is used, the trellis diagram can be divided into sub-trellis areas for each code. In Fig. 11, A1 and A2 are the same as in code1, b1 = (00, 01) and b2 = (10, 11).

Please replace paragraph [0049] starting on page 8 with the following rewritten paragraph:

Next is shown a code with a transmission rate that can be varied according to the mode, and which can be used in Gaussian noise and fading noise environments. Hereinbelow this is referred to as code 2. Fig. 8 shows a block code with code length L, where L=3L'. This block code has four transmission modes. With the frame using the same L symbols, the

number of transmitted bits and the code distance characteristics can be changed. Code characteristics are listed in Table 2 below.

Table 2

	Mode 1	**Mode 2**	**Mode 3**	**Mode 4**
code level	4	4	2	2
l1 code	mode-index code			
l2 code	(L, L-1, 2)			
l3 and l4 code	(L, L, 1)	(L, L-1, 2)	---	---
modulation	16QAM		QPSK	
signal partition	SP1	SP2	SP1	SP2
trans. rate (bit/sym)	$\frac{3L-1}{L}$	$\frac{3L-3}{L}$	1	$\frac{L-I}{L}$
MSED between different modes	$2L\Delta^2/3$			
MSED between same modes	$4\Delta^2$	$4\Delta^2$	$9\Delta^2$	$18\Delta^2$
MSD between different modes	2L/3			
MSD between same modes	1	2	1	2
MPD between different modes	$(2L\Delta^2/3)^{2L/3}$			
MPD between same modes	$4\Delta^2$	$16\Delta^2$	$9\Delta^2$	$324\Delta^2$